APPENDIX C: CONSERVATION AND MITIGATION MEASURES

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INTRODUCTION

Included in Appendix C are a variety of measures that may be implemented by the BLM in the Rawlins Field Office to conserve natural resources and to mitigate the effects of actions on federal lands. The measures described here are Best Management Practices (BMPs), Conditions of Approval (COAs), Terms and Conditions (T&C), and Required Design Features (RDFs).

BMPs are "state-of-the-art mitigation measures designed to provide for safe and efficient operations while minimizing undesirable impacts to the environment" (BLM 2007c). The objective of BMPs is to reduce impacts to wildlife, air quality, landscapes, and other natural resources as activities on federal lands are pursued. Although the use of BMPs is recommended, they are not regulatory requirements and are voluntarily implemented as conditions warrant.

COAs are restrictions, or conditions, placed on the approval of a federal permit. In the case of oil and gas development, they are attached to an approved Application for Permit to Drill (APD) to ensure environmental protection, safety, and/or conservation of mineral and natural resources. Many COAs are in fact BMPs that have been made a requirement of the permit to drill to federal fluid minerals.

T&C are similar to COAs except that they are placed on federal right-of-way (ROW) grants. Like COAs, many T&C are BMPs that have been made a requirement of right to construct a road or other facility on federal surface.

RDFs are measures that may appear elsewhere as BMPs, COAs, or T&C, but that have been formulated or revised specifically to protect Greater Sage-Grouse or its Priority Habitat Management Areas (PHMAs) or to mitigate impacts to Greater Sage-Grouse populations or PHMAs. The RDFs included here are from the Wyoming Approved Resource Management Plan for Greater Sage-Grouse, Appendix D (BLM 2015).

BEST MANAGEMENT PRACTICES

BMPs for oil and gas development are intended to reduce impacts to wildlife, air quality, landscapes, and other natural resources as energy resources are developed. Although the use of BMPs is highly recommended, they are not regulatory requirements. The BLM's policy is that all "[f]ield [o]ffices consider BMPs in National Environmental Policy Act (NEPA) documents to mitigate anticipated impacts to surface and subsurface resources, and also to encourage Operators to actively consider BMPs during the application process." (Instruction Memorandum No. 2004-194; June 22, 2004) More information on BMPs suggested by the BLM can be found on the BLM's national website at: http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices.html.

Another important source of information on BMPs is the publication Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (commonly referred to as The Gold Book), which was developed to educate Operators on the requirements for obtaining permit approval and conducting environmentally responsible oil and gas operations on Federal lands. It is available online at: http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/gold_book.html.

BMPs that may have particular application to the Rawlins Field Office can be found in the following parts of the Rawlins Resource Management Plan (RMP) (BLM 2008):

- Appendix 1—Wyoming Bureau of Land Management Mitigation Guidelines for Surface Disturbing and Disruptive Activities
- Appendix 13—Reducing Nonpoint Source Pollution with Best Management Practices
- Appendix 15—Best Management Practices for Reducing Surface Disturbance and Disruptive Activities
- Appendix 16—Mountain Plover Management Guidelines: Occupied Habitat Protection Measures
- Appendix 24—Mitigation Guidelines for Special Status Plants

These appendices and the entire Rawlins RMP Record of Decision can be found at:

http://www.blm.gov/wy/st/en/programs/Planning/rmps/rawlins/rod_armp.html.

CONDITIONS OF APPROVAL

In the process of acquiring permission to drill to a federal oil and gas lease, leaseholders submit an APD to the BLM Field Office that manages the public lands where their lease is located. Included with the APD are:

- a drilling plan that contains a description of the leaseholder's drilling program, geologic data, expected hazards and proposed mitigation measures to address such hazards;
- a surface use plan of operations that describes the locations of the drillpad and the access road, details of pad construction, and methods for containment and disposal of waste material; and
- a reclamation plan, which includes a weed management plan.

When the BLM has completed the necessary environmental and technical review of the proposal contained in the APD, the BLM may approve the APD as submitted or, more typically, approve the APD subject to COAs.

COAs are attached to an approved APD to ensure environmental protection, safety, and/or conservation of mineral and natural resources. They arise from a variety of controlling authorities such as the Federal Land Policy and Management Act (FLPMA), the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA). The COAs attached to an APD can be general in nature or site-specific, and thus will vary from one BLM Field Office to another. Typically, a Field Office develops COAs over a number of years of active management of oil and gas development. Often the Field Office RMP provides either a listing of potential COAs or the BMPs that might guide development of site-specific COAs in that area. They can address topics as wide-ranging as protection of wildlife habitat or archeological and paleontological sites, noise reduction, wildfire suppression, or management of invasive species. A BLM study of a number of Field Offices that manage oil and gas development identified 175 different COAs that are used to mitigate surface-disturbing activities (BLM 2006c). Included in this Appendix is a list of COAs that are typically used in the Rawlins Field Office when approving APDs. The list is often adapted as needed for site-specific use. If specific resource concerns are identified that require additional COAs that are not on the list, additional COAs may be added. The list is presented in the standard format used for attachment to an approved APD.

GENERAL

1. Approval of this Application for Permit to Drill (APD) does not warrant that any party holds equitable or legal title.
2. All lease exploration, development, construction, production, operations, and reclamation activity shall be conducted in a manner which conforms to all applicable federal, state, and local laws and regulations.
3. All lease operations are subject to the terms of the lease and its stipulations, the regulations of 43 CFR Part 3 100, Onshore Oil and Gas Orders, Notices to Lessees (NTL's), the approved APD, and any written instructions or Orders of the Bureau of Land Management (BLM) Authorized Officer (AO).
4. The approval of this APD does not grant authority to use off-lease federal lands. Facilities approved by this APD and/or Sundry Notices that are no longer included within the lease, due to a change in the lease or unit boundary, will be authorized with a right-of-way. Similarly, should unit or lease boundaries change during the life of the project, the Operator will be responsible for acquiring necessary rights-of-way for affected facilities. Failure to do so may cause the operation to be shut-in.

5. This permit is valid for a period of two years from the date of APD approval or until lease expiration or termination, whichever is sooner. APD extensions may be requested and granted for up to two additional years, but not to exceed a total sum of four years from the initial APD approval date. Should a permit extension be requested, it must be submitted prior to the permit expiration date via a Sundry Notice (Form 3160-5) to the AO for approval. If the permit terminates, any surface disturbance created under the application shall be reclaimed in accordance with the approved reclamation plan found herein.
6. The Operator shall submit a Sundry Notice (Form 3160-5) to the AO for approval prior to beginning any new surface-disturbing activities or operations that are not specifically addressed and approved by this APD.
7. The Operator may submit to the AO's Representative written requests (including documentation, supporting analysis and an acceptable plan for mitigation of anticipated impacts) for exception, waiver, or modification to this approved APD, associated Conditions of Approval (COA), or other requirements. Such written approval shall be obtained prior to commencement of operations that cause any deviation from the approved APD and associated limitations. Emergency approval may be obtained orally, but such approval does not waive the written reporting requirement.
8. At **least 48 hours prior to** beginning any APD-related construction (e.g. access road, well pad, pipeline) and/or reclamation activities (e.g. dirt-work, seeding) the Operator shall notify the BLM via internet notice.
9. All construction of the well pad, flare pit, reserve pit, roads, flow lines, production facilities, and all associated infrastructure on federal lands shall be monitored onsite by a licensed professional engineer OR designated qualified inspector (to be named at the time of construction notification) who will serve as the Operator's Compliance Coordinator to ensure construction meets the BLM-approved plans.
10. Within **24 hours** of spudding the well, the spud date shall be submitted to the BLM via internet notice. A follow-up report on Form 3 160-5 confirming the date and time of the actual spud shall be submitted to this office within 5 working days from date of spud.
11. At **least 24 hours in advance** of all BOP tests, running and cementing all casing strings (other than conductor casing), pluggings, DST's and/or other formation tests, and drilling over lease expiration dates, notification shall be submitted to the BLM via internet notice.
12. Prior to construction, the Operator shall submit a production facility layout for approval (Onshore Order 1, Section 111. D.4.d. and D.4.i., or Section VIII. A.) that includes permitted location boundaries, production facility placement, access road inlet, and cut/fill slopes.
13. A site facility diagram (Onshore Order 3, Section 111. I. and 43 CFR 3 162.7-5(d)) for the purpose of a site security plan (Onshore Order 3, Section 111. H. and 43 CFR 3 162.7-5(c)) shall be filed no later than 60 calendar days following first production.
14. Use of any tank heater/burners in production storage tanks must be approved by the AO prior to installation and/or use. Failure to obtain approval for installation/use of tank heater/burners in any production storage tanks may result in a Written Order (WO), Incidence of Non-compliance (INC), assessments and/or potentially a Shut-In Order.
15. No below or partially below ground fluid storage/containment tanks or vessels are to be used without prior approval of the AO. Below or partially below ground fluid storage/containment tanks or vessels shall require systems for the prevention, containment, detection, and monitoring of any below ground leakage (e.g. secondary containment and leak detection/monitoring systems, etc.). A production facility layout depicting the proposed vessel construction and installation/location must be submitted for prior approval via APD or Sundry. As applicable, all subsurface vessels must comply with the

Wyoming Storage Tank Act of 2007 (W.S. 35-1 1-14-29) and/or the Wyoming DEQ Underground Injection Control (UIC) Program.

16. No pipelines or flow-lines or related rights-of-way are approved with the APD. Well pipelines or flow-lines and related rights-of-way, including plans of development, must be submitted for approval via Sundry Notice or Right-of-Way Application (SF-299) as applicable, prior to construction.
17. The BLM AO may request and schedule a meeting with the Operator or Operator's representative to discuss the APD and terms and COAs. Such meeting would be held in the BLM offices, within 30 days of the APD approval.
18. The BLM AO may request to schedule a meeting with the Operator or Operator's representative (dirt contractor, construction contractor, surveyors, etc.) to discuss construction and related requirements. Such meetings would be held in the BLM office and in the field within 60-90 days prior to surface disturbance and construction. The BLM AO may require surveys and re-stacking of all project construction and disturbance prior to field inspection.

OPERATIONS

1. Upon request, Operator must be prepared to provide copies of applications for, and approved copies of, federal, state, and local operating permits.
2. All survey monuments found in the area of operations shall be protected. Survey monuments include, but are not limited to: General Land Office and BLM Cadastral Survey Comers, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the Operator shall immediately report the incident, in writing, to the AO and the respective installing authority if known. Where General Land Office or BLM right-of-way monuments or references are obliterated during operations, the Operator shall secure the services of a registered land surveyor or a BLM cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the "Manual of Surveying Instructions for the Survey of the Public Lands in the United States," latest edition. The Operator shall record such survey in the appropriate county and send a copy to the AO. If the Bureau cadastral surveyors or other federal surveyors are used to restore the disturbed survey monument, the Operator shall be responsible for the survey cost.
3. If any cultural values (sites, artifacts, human remains) are observed during operation of this lease/permit/right-of-way, they will be left intact and the AO notified. The AO will conduct an evaluation of the cultural values to establish appropriate mitigation, salvage or treatment. The Operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the Operator is to immediately stop work that might further disturb such materials, and contact the AO. Within seven (7) days after the Operator contacted the BLM, the AO will inform the Operator as to: whether the materials appear eligible for the National Register of Historic Places; the mitigation measures the Operator will likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and a time-frame for the AO to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that mitigation is appropriate. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the Operator will then be allowed to resume construction.
4. The Operator will be responsible for the cost of any mitigation required by the AO. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the

AO that the required mitigation has been completed, the Operator will be allowed to resume operations.

5. If paleontological resources, either large or conspicuous, and/or of a significant scientific value are discovered during construction, the find will be reported to the AO immediately. Construction will be suspended within 250 feet of said find. An evaluation of the paleontological discovery will be made by a BLM-approved professional paleontologist within five (5) working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological values. Operations within 250 feet of such a discovery will not be resumed until written authorization to proceed is issued by the AO. The Operator will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operation.
6. The Operator will be responsible for informing all persons associated with this project that they will be subject to prosecution for damaging, altering, excavating or removing any archaeological, historical, or vertebrate fossil objects or site. If archaeological, historical, or vertebrate fossil materials are discovered, the Operator shall suspend all operations that further disturb such materials and immediately contact the AO. Operations shall not resume until written authorization to proceed is issued by the AO.
7. Within five (5) working days, the AO will evaluate the discovery and inform the Operator of actions that will be necessary to prevent loss of significant cultural or scientific values.
8. The Operator shall be responsible for the cost of any mitigation required by the AO. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the Operator shall be allowed to resume operations.
9. If any dead or injured threatened, endangered, proposed, or candidate animal species is located during construction or operation, the U.S. Fish and Wildlife Service's Wyoming Field Office (307-772-2374), its law enforcement office (307-261 -6365), and the BLM Rawlins Field Office (307-328-4200) shall be notified within 24 hours. If any dead or injured sensitive species is located during construction or operation, the Rawlins Field Office shall also be notified within 24 hours.
10. If dead or injured raptors, big game, migratory birds, or unusual wildlife are observed on the project area, Operator personnel will contact the appropriate BLM and WGFD offices. Under no circumstances will dead or injured wildlife be approached or handled by Operator personnel.
11. Operators shall notify the BLM immediately if raptors are found nesting on or within 1,200 feet of project facilities and assist the BLM as necessary in erecting artificial nesting structures (ANSs) as appropriate. The use of ANSs will be considered as a last resort for raptor protection. If nest manipulation or a situation requiring a "taking" of a raptor nest becomes necessary, a special permit will be obtained from the Denver USDI-FWS Office, Permit Section and will be initiated with sufficient lead time to allow for development of mitigation. Required corresponding permits will be obtained from the WGFD in Cheyenne. Consultation and coordination with the USDI-FWS and WGFD will be conducted for all protection activities relating to raptors.
12. Operator and Operator’s sub-contracted personnel shall not intentionally harm or harass wild horses, other wildlife, or domestic livestock.
13. Right-of-way, mineral lease, mining claim, and permit holders shall monitor and control noxious and invasive weeds, according to an approved weed management plan, on project-disturbed areas and native areas infested as a direct result of the project. The control methods shall be in accordance with guidelines established by the EPA, BLM, state and local authorities. Prior to the use of pesticides, the Operator will obtain written approval from the AO—meaning an approved Pesticide Use Proposal

form—showing the type and quantity of material(s) to be used, pest(s) to be controlled, method of application, etc.

14. Pesticide Use Proposals shall be submitted to and approved by the BLM AO-Weed Coordinator, prior to any application of any herbicide on the BLM lands. Pesticide Use Proposals will be tiered to the approved Reclamation Plan/Weed Management Plan.
15. Copies of daily Pesticide Application Records (required by the State of Wyoming) and Summary Herbicide Use Reports are due monthly to the BLM AO-Weed Coordinator.
16. The Operator shall be responsible for the prevention and suppression of fires on public lands caused by its employees, contractors, or its subcontractors. During conditions of extreme fire danger, surface use operations may be either limited or suspended in specific areas, or additional measures may be required by the AO. Should a fire occur, it shall be immediately reported to this office by calling 307-328-4200 and notifying the Fluid Minerals staff.
17. Emissions of particulate matter from well pad, road, and other facility construction, operation, and reclamation activities will be minimized by application of water or other dust suppressants. Dust inhibitors (surfacing materials, dust suppressants, and water) will be used as necessary on locations that present a fugitive dust problem. The use of chemical dust suppressants on public surface will require prior approval from the AO.
18. If groundwater or permeable/porous subsoil or bedrock is encountered upon construction of the pad or pits, or upon drilling and completing shallow holes for surface conductor, rat/mouse holes, or water supply well, the Operator must immediately notify the AO's Representative before proceeding.
19. The Operator shall comply with the Hazardous Materials Management Plan/Summary in the RMP ROD (Appendix 32) and/or the appropriate EIS ROD, including requirements to transport, store, utilize, and dispose of hazardous substances. The Operator shall maintain a hazardous substances release contingency plan that shall include, among other things, provision to notify the AO in the event of any release of hazardous substances associated with project operations. Treatment chemicals may require additional storage and containment measures and facilities depending on chemical classification and hazard.
20. If a portable sewage treatment facility is moved onto location, the well/lease Operator shall provide the BLM AO a copy of the facility Operator's notification letter to the Wyoming Department of Environmental Quality. Facility operations shall comply with BLM requirements, including unauthorized discharge notification and reclamation of disturbed surfaces.
21. Only those hazardous wastes that qualify as **exempt,** under the Resource Conservation and Recovery Act (RCRA), Oil and Gas Exemption, may be disposed of in the reserve pit. Generally, oil or gas wastes are exempt if they:
22. have been sent down hole and then returned to the surface during oil/gas operations involving exploration, development, or production, or
23. have been generated during the removal of produced water or other contaminants from the oil/gas production stream. The term hazardous waste, as referred to above, is defined as a **listed** (40 CFR 261 -31 -33) or **characteristic** (40 CFR 261.20-24) hazardous waste under RCRA.
24. Any spilled or leaked oil, produced water or treatment chemicals must be reported in accordance with NTL- 3A and immediately cleaned up in accordance with BLM requirements. This includes clean-up and proper disposition of soils contaminated as a result of such spills/leaks. The Operator shall segregate, treat, and/or bio-remediate contaminated soil materials as authorized via Sundry Notice (Form 3 160-5) or dispose of contaminated soils at a permitted waste facility. Treatment chemicals may require additional storage and containment measures and facilities depending on chemical classification and hazard.

25. The Operator shall install an identification sign consistent with the requirements of 43 CFR 3 162.6 immediately upon completion of the well pad/location construction operations.
26. The Operator shall contain and remove all debris, unused equipment, and other waste materials not needed for production. Waste materials shall be disposed of at an approved disposal facility.
27. Upon APD expiration, it is the responsibility of the Applicant/Operator to see that all stakes, flagging, posts or other materials placed on the locations and/or access roads, pipelines and associated rights-of-way are removed. Operator must immediately cease all operations associated with preparing to drill the well and begin final reclamation activities of all APD related disturbance, pursuant to the approved APD Conditions of Approval and to be completed within 6 months of the APD expiration date.
28. Employee and contractor education will be conducted regarding wildlife laws. If violations are discovered on the project area, Operators will immediately notify the appropriate agency. Operators will implement policies designed to control off-site activities of personnel, that may result in littering or resource damage.
29. Company and contractor employees operating motorized equipment will undergo training describing the types of wildlife in the area, the circumstances under which collisions are likely to occur and the measures that can be employed to minimize collisions.

CONSTRUCTION

1. All facilities on location that have the potential to leak/spill oil, glycol, methanol, produced water, condensate, or other fluids which may constitute a hazard to the environment, public health or safety (including, but not limited to, drain sumps, sludge holdings, and chemical containers), shall be within secondary containment, impervious to those fluids, exclusive of wildlife and livestock, with animal/bird escape capability, and able to contain a minimum of 110% of the volume of the largest storage vessel, respective to content, or 100% with at least one foot of freeboard, whichever is greater, so that any spill or leakage would not drain, infiltrate, or otherwise escape to ground water, surface water, or navigable waters before cleanup can be completed (within 72 hours).
2. Construction over and/or immediately adjacent to existing pipelines shall be coordinated, and in accordance with, the relevant pipeline companies' policy.
3. Fencing shall be installed around produced water, oil, and condensate tank batteries in order to help maintain the integrity of the surrounding containment structure and to prevent livestock and wildlife from entering the area in case of a leak or spill.
4. All open vent stack equipment shall be designed and constructed to prevent entry by birds and bats and to discourage perching.
5. The immediate repair/replacement (to BLM standards) of any range infrastructure breached, altered, or damaged by construction, drilling, or operation activities related to this APD shall be the responsibility of the Operator. All fence relocations will be in accordance with BLM approval.
6. Construction, maintenance, and reclamation operations with frozen material or during periods when the soil material is saturated is expressly prohibited. If equipment, including licensed highway vehicles, creates ruts in excess of four (4) inches deep, the soil shall be deemed too wet to adequately support maintenance and/or heavy equipment.
7. Accumulated snow present on the ground at the outset of construction, maintenance, or reclamation activities shall be removed before the soil is disturbed and piled downhill and/or downwind from the disturbed area. Equipment used for any non-construction snow removal operations will be equipped with 6" shoes to ensure blades do not remove topsoil or vegetation. Written approval must be

obtained before snow removal related to a federal action but outside of designated disturbance areas is undertaken.

8. When blading/removing snow, drifts/berms shall be constructed with a gap of 35 yards every 1/4 mile, to allow unobstructed movement of wildlife, livestock and human activities.
9. If right-of-way fencing is required, it will be kept to a minimum and the fences will meet the BLM/WGFD approval for facilitating wildlife movement. Wildlife-proof fencing will be used only to enclose areas that are potentially hazardous to wildlife species or reclaimed areas where it is determined that wildlife species are impeding successful vegetation establishment.
10. Snow fences, if used, will be limited to segments of one-quarter mile or less. In addition, escape openings will be provided along roads in big game crucial winter ranges, as designated by the BLM, to facilitate exit of big game animals from snowplowed roads.
11. Clearly remove, segregate, and delineate from all other spoils, all available topsoil from constructed locations and surface disturbances including areas of cut and fill. Stockpile and clearly identify topsoils at the site for use in reclamation on all areas of surface disturbance (well pads/locations, roads, pipelines, etc.).
12. Plugs or embankments providing wildlife with access out of and across open pipeline trenches shall be installed, at minimum, every 1,320 linear feet along open pipeline trenches.
13. No construction and/or reclamation shall block or change the natural course of any drainage, nor shall topsoil, waste, or fill material be deposited below high water lines in riparian areas, flood plains, or in natural drainage ways. The lower edge of soil or other material stockpiles will be located outside active floodplains. All spoils will be placed where they can be retrieved without creating additional surface disturbance and where they do not impede and/or contribute sediment to watershed and drainage flows. The Operator shall also reconstruct and stabilize stream channels, drainages, and ephemeral draws to exhibit similar hydrologic characteristics that were found in stable, naturally occurring and functioning systems.
14. Drainage and run-on/runoff shall be diverted away from all new construction naturally or through the use of diversion ditches/berms and/or soil berms or stockpiles. All drainage structures shall approximate topographic contour lines, have a grade no greater than 0.5 to 1 percent, and shall release water onto natural undisturbed ground without causing additional and/or accelerated erosion. Drainage structures shall not discharge directly into/onto natural drainages/channels, and/or use riprap or other armoring to protect from erosion (BLM Manual 9113). Water-bars, waddles, hay bales, and/or silt fences shall be used as needed to reduce surface runoff velocity and promote upland sediment deposition, thus reducing drainage/channel sedimentation and erosion.
15. Silt fences, if needed, would be installed after topsoil removal and before pad leveling begins and must remain in place until interim reclamation is complete and there is adequate vegetation present to stabilize the soil. Silt fences would be constructed in locations where surface erosion is evident or potential for surface erosion exists such as areas of steep slopes or highly erosive soils. Fences would be installed at the inside edge of disturbance.
16. Silt fences would be constructed using metal posts that are at least 5 feet long with at least 2 feet in the ground (3 feet above ground) with 8 feet spacing if a wire re-enforcement backing is used or 6 feet spacing if no wire backing is used. The fabric is to be toed into the ground at the base of the fence a minimum of 8 inches deep and an 18 inch overlap is required when splicing two fences together. The fabric is to be installed on the uphill side of the metal posts and attached to the posts at least every 6 inches along the length of the post. Silt fences are to be inspected at least once a month or 48 hours after a rain storm event. If holes in the fence or undercutting of the fence are found, repair is

required within 48 hours of discovery. When silt accumulates to a height equal to two-thirds the height of the fabric, the silt is to be cleaned out and deposited on the excess spoils pile.

17. Sediment fences, straw wattles, erosion mats and/or hay bales should be used to minimize erosion and sediment transport on disturbance area.
18. If temporary surface pipelines, as authorized by the AO, are used to transport water, they shall be placed/removed when the ground surface is dry. Surface blading prior to line placement is prohibited. The pipelines must be removed within 30 days after well completion (or determination of inactivity).
19. Construction control stakes shall be placed as necessary to ensure construction of the well pad, topsoil stockpile, spoil pile, and outer limits of the area to be disturbed in accordance with the specifications outlined in the APD. The Operator shall assume full responsibility for protecting all stakes and offsetting any additional stakes or grades which may be necessary.
20. All production facilities including but not limited to tanks, separators, dehydrators, meters, etc. would be co-located on nearby producing well locations, in accordance with an approved Sundry Notice of Intent for construction. All wells, above-ground structures, production equipment, tanks, transformers and insulators not subject to coloring requirements for safety would be painted the color of "non reflective Shale Green".
21. To protect the identified ferruginous hawk nests, Greater Sage-grouse leks and wintering big game habitat, the project proponent will install housing and/or muffler(s) around equipment that exceeds 55 dBA (ES-7, 4-69, 4-157 AR EIS)
22. Cathodic protection wells would be drilled on the existing well pad, placed so as not to interfere with re-contouring of cut-and-fill slopes during interim reclamation, designed and constructed to prevent commingling and contamination of water aquifers. The AO would be notified of any water flows at surface and the problem would be resolved promptly.
23. All stacks, exhauster, or vent pipes shall have anti perch cones and vent covers to prevent bat or small bird entry and entrapment.

ROADS

1. All access roads and drainage control structures, whether existing or newly constructed, shall be both constructed to resource road standards and regularly maintained in a safe and usable condition as outlined in BLM Manual, Section 9113. A regular maintenance program may include, but is not limited to, blading, ditching, culvert installation, dust control, and gravel surfacing or other activities as specified by the AO. The Lessee and/or Operator shall enter into a maintenance agreement with all other "authorized users" of the common access road(s) to the well site. The costs of road maintenance in dollars, equipment, materials, labor, and other related expenses shall be shared proportionally among the "authorized users." Upon request, the AO shall be provided copies of any maintenance agreement or agreements.
2. Access roads would be constructed to the BLM Road Standards in such manner as to minimize cuts and fills and minimize erosion and sedimentation and maximize reclamation, as determined during the onsite.
3. **Engineered Roads** and/or **culverts** shall be designed in accordance with the Engineered Road Requirements, with four copies of the following information submitted to the BLM project NRS for approval, prior to construction.
    a. Plan, profile, and typical cross-section.
    b. Centerline stakes shall be placed in the field, with culvert locations marked on the centerline, for the BLM review before final design approval. In addition, slope stakes shall be placed at the top

of the cut and the bottom of the fill for those portions of the road that are engineered. All roadways cuts and fills shall be designed to balance from earthwork within the ROW, or an approved borrow source.

c. Perform a "hydrologic analysis" to design culverts sized to pass a 25-year precipitation event with no head developed at the culvert inlet.

d. The submitted plans must be signed/certified by a professional engineer and will include any special notes for construction and cut/fill balance notes.

4. All Operator and Operator's representative vehicles are restricted to authorized travel routes only and shall not use any other access route, e.g.; two-track roads, trails, and pipeline rights-of-way to access the drill/ell pad and any ancillary facilities.

5. Two-track roads shall not be cut off as a direct result of construction, maintenance, or reclamation of the well access road or associated well facilities, unless authorized by the BLM.

6. Prior to construction, road(s) shall be surveyed and staked with construction control stakes set continuously along the centerline at maximum 100-foot intervals (less where needed to be inter-visible) and at all tangent and curve control points, fence or utility crossings, and culverts. In addition to centerline stakes, slope stakes shall be placed at the top of the cut and the bottom of the fill for those portions of the road that are engineered.

7. Before proposed road construction activities begin, the topsoil must be bladed to the side of the road and stockpiled. The topsoil stockpile shall be contoured so as to prevent water ponding or flow concentration. Once the borrow ditch and the cut slopes are constructed, cleared vegetative material and topsoil that is windrowed shall be spread back onto the cut/fill slopes of the road, removing any windrows or berms remaining at the edge of the road.

8. The minimum travel-way width of the immediate access road will be 14 feet with turnouts at least 10 feet in width. No structure will be allowed to narrow the road top. The inside slope will be 4: 1. The bottom of the ditch will be a smooth V with no vertical cut in the bottom. The outside slope will be 2:1 or flatter. After the road is crowned and ditched with a .03-.05 ft/ft crown, the topsoil and windrowed vegetative material shall be pulled back down on the cut slope so there is no berm left at the top of the cut slope. Turnouts will be spaced at a maximum distance of 1,000 feet and will be intervisible. If the access road crosses a floodplain, the ditch shall be flat-bottomed so as to provide material to raise the road, unless otherwise approved by the AO.

9. If soils along the access road route are dry during road construction, use, and/or maintenance, fresh water shall be applied to the road surface to facilitate soil compaction and minimize soil loss as a result of wind erosion.

10. Construction and surfacing of the new access road shall be complete prior to moving drilling equipment onto the well pad and the presence of heavy vehicular traffic. Compact the top foot of sub-grade in even 6 to 8-inch lifts to established standards, adding water as needed for compaction. Surface with an appropriate grade of gravel to a minimum depth of four (compacted) inches.

11. All cattle guards shall be designed and maintained consistent with BLM standards and shall be a minimum of 16 feet wide and 8 feet long; set on either timber, pre-cast concrete, or cast-in-place concrete bases at right angles to the roadway. They shall have drop-down wings and an adjacent 16-foot-wide tubular bypass gate; not narrow the road surface; and have fence and end panels on either side constructed using 3 posts with "H" braces.

12. All culverts shall be a minimum of 18 inches in diameter. Culverts shall have a minimum of 12 inches of fill or 1/2 the pipe diameter, whichever is greater, placed on top of the culvert, and shall be of length sufficient to allow at least 12 inches of culvert to extend beyond the toe of any slope. The

inlet and outlet shall be set on grade. No rocks shall be used in the bed material and no rocks greater than 2 inches in diameter will be immediately adjacent to the culvert. The entire length of pipe shall be bedded on native material before backfilling, which shall be completed using unfrozen material and rocks no larger than two inches in diameter; compact the backfill evenly in 6-inch lifts on both sides of the culvert. A permanent marker shall be installed at both ends of the culvert to help prevent traffic from damaging the culvert. Additional culverts will be placed in the new access road as the need arises or as directed by the AO.

13. Wing-ditches shall be staked and constructed at a slope of .5 to 1.0 percent downslope unless otherwise approved by the AO. All wing/drainage ditches and culverts shall be kept clear and free flowing, and shall also be maintained in accordance with the original construction standards. Drainage structures shall not discharge directly into/onto natural drainages/channels, and/or use riprap or other armoring to protect from erosion (BLM Manual 9113).
14. Low water crossings shall be constructed perpendicular to the channel and at original channel elevation in a manner that will not block or restrict existing channel flow. Excavated material shall be stockpiled for use in reclamation of the crossings.

PITS

1. All oil and gas pits that could contain fracture/stimulation fluids, recycled pit fluids, or produced water, except those only containing fresh-water based constituents, are required to be lined with an impermeable (12 mil minimum with a permeability less than or equal to 1 X 10-7 cm/sec) liner. The liners shall be physically and chemically compatible with all substances which it may contact and shall be of sufficient strength and thickness to withstand normal installation and use, and installed so that it will not leak. The liner shall be installed over a smooth sub-grade, matting, or fill materials (e.g. sifted dirt, sand, or bentonite) free of pockets, loose rocks, and other objects that could damage the liner.
2. The only fluids/waste materials which are authorized to go into reserve pits are RCRA-exempt exploration and production wastes. Any evidence of RCRA non-exempt wastes being put into the reserve pit may result in the BLM AO requiring specific testing and closure requirements.
3. All pits are required to maintain a minimum of 2 feet of freeboard between the liquid level and the top of the liner. If operations cause fluid levels in pits to rise above the required freeboard, immediate notification shall be provided to the AO with concurrent steps taken to cease the introduction of additional fluids, until alternative containment methods can be approved.
4. Flaring of gas into the reserve or completion pits will not be allowed without prior approval from the AO. Flaring into lined pits is prohibited.
5. All pits shall be kept free of trash, debris, solid wastes, and other unauthorized waste materials including oil and liquid hydrocarbons.
6. For the protection of livestock and wildlife, all pits and open cellars shall be fenced on all sides, with corner bracing, immediately upon construction. Reserve, flare, completion, and production pits shall be adequately fenced during and after drilling operations until pits are reclaimed so as to effectively keep out wildlife and livestock. Operator shall, within ten (10) days of discovery, remove any floating hydrocarbons from pit surface. Approved netting (mesh diameter no larger than one inch) is required over any pit that contains or is identified as containing hydrocarbons or hazardous substances (per RCRA 40 CFR Part 26 1 or CERCLA Section 10l (14) (E)).
7. Pits shall be dried, backfilled, and closed within six (6) months from well completion (total depth) or well plugging. Pits must be void of all free fluids prior to backfilling. Pit trenching or squeezing is prohibited. Pits may be dewatered/dried in the following manner: natural evaporation, mechanical

aeration, chemical and mechanical solidification (e.g. with fly ash, cement kiln dust, etc.) and/or hauled to an approved DEQ disposal site. The installation/operation of any sprinklers, misters, aerators, pumps, hoses, and related equipment shall ensure that water spray or mist does not drift outside of the pit. All other dewatering/drying, removal or disposal methods not listed in the APD and or COAs shall have prior written approval from the AO.

8. Pits, once dry, shall be backfilled and compacted with a minimum cover of five (5) feet of soil, void of any topsoil, vegetation, large stones, rocks or foreign objects. The pit area shall be mounded to allow for settling and to promote positive surface drainage away from the pit. Before backfilling synthetically lined reserve pits, those liner portions remaining above the "mud line" shall be cut off as close to the top of the mud surface as possible and disposed of at an approved solid waste disposal facility. The pit bottom and remaining liner shall not be trenched, cut, punctured, or perforated.

FLUIDS

1. All storage, removal and disposal of produced water must be in accordance with and comply with Onshore Oil and Gas Order No. 7. Produced water must be disposed of at a permitted off-site commercial disposal facility, unless approved otherwise by the BLM AO. The onsite storage/disposal of produced water, in open pits, tinhorns, sumps, etc., is not authorized except as follows: 1) produced water from the well subsequent to drilling may be disposed of in the approved well site reserve pit (for up to 90 days), and/or 2) used for well drilling or completion, upon prior written approval from the AO via approved APD or Sundry. Produced water may be transported and used for drilling/completion operations from approved fee, state, or federal wells/leases to federal wells/leases within the developed field/unit and/or EIS area, subject to WOGCC and BLM approval.
2. Pit drilling fluids may be transferred from a reserve pit at an approved federal well location to a lined reserve pit at another approved federal well location, for the purpose of drilling the well. Transfer/reuse shall only be permitted when transfer is by a lease Operator from one or more pits to another pit or pits on the Operator's federal lease/unit or adjacent federal lease. Unless approved by this APD, the transfer and reuse of pit drilling fluids shall require prior written approval from the AO, via a Sundry Notice (Form 3160-5).
3. The AO may authorize the use of produced water or reuse of pit drilling fluids for drilling when: 1) surface casing has been set with fresh water through **any** and all possible fresh water zones, 2) use is for drilling/completion only, and 3) the receiving pit is lined.
4. Pit fluids may be transferred by a lease Operator from one or more pits to another (lined) pit or pits on the Operator's federal lease/unit or adjacent federal lease, for the purpose of fluid consolidation and mechanical/chemical drying and disposal. The 6-month pit closure requirement shall apply. Unless approved by this APD, the transfer of pit fluids for consolidation/disposal shall require prior written approval from the AO, via a Sundry Notice (Form 3160-5).
5. Initial Operator requests for the transport and use/reuse of produced water or pit drilling fluids or the transfer/consolidation of pit fluids shall include: 1) the potential locations/leases in which fluids are to be transferred to and from, and 2) the potential quantity to be moved. Requests shall be submitted for prior written approval from the AO via APD or Sundry Notice. Upon completion of transport, use/reuse or consolidation, the specific information on leases, units or locations and quantities transferred shall be submitted to the AO, via Sundry Subsequent Report. Transportation of fluids shall be along approved haul routes and authorized right-of-ways. Temporary surface pipelines may be authorized by the AO for the transfer of fresh water only, and NOT for produced water or pit fluids.
6. Drilling water sources/supplies or any changes to drilling water sources/supplies, the fate of drilling/completion fluids, routes and means of fluid transportation/disposal, and location or method of produced water disposal requires prior written approval from the AO via approved APD, Sundry

Notice or Right-of-way (ROW) as applicable. The drilling of water wells on federal lands shall require prior BLM approval via APD, Sundry, or ROW as applicable, in addition to State Engineer Office (SEO) approval.

RECLAMATION

1. A reclamation plan shall be submitted with each APD. The reclamation plan will address short-term stabilization to facilitate long-term reclamation. The reclamation plan is considered complete when all the reclamation requirements described in the BLM Reclamation Policy and the Rawlins RMP have been addressed, the techniques to meet the reclamation requirements are described in detail, and the BLM concurs with the reclamation plan. Surface disturbance will not be allowed until the reclamation plan is submitted, complete and approved by the BLM Authorized Officer.
2. The Reclamation Plan shall include:
    a. Prior to any surface-disturbing activities, vegetation inventories shall be conducted on each ecological site and they shall be mapped. At a minimum, vegetation inventories shall be conducted for basal cover and vegetative life form type and frequency (including individual invasive and noxious weed species) and include at least one photograph of each transect. An inventory of 100 to 400 points (depending on the amount and type of vegetative cover) using transects is highly recommended. The inventory method shall be included within the Reclamation Plan for approval.
    b. Prior to the completion of interim and final reclamation, the Operator shall sample and test soils for suitable surface and subsurface physical and chemical properties. At a minimum the soil shall be tested for texture, electrical conductivity, reactivity, pH and photographed. At least one photograph at each soil pit is required which also shows the vegetation community. These tests are to be used by the Operator to evaluate the suitability of the soils or seedbed for seed germination and potential for vegetative success under the approved reclamation plan.
    c. Prior to the completion of interim and final reclamation and seeding, the Operator shall submit to the BLM AO, via Sundry Subsequent Report (Form 3160-5), the results of all vegetative and soils surveys and tests. Should pre-disturbance and interim/final reclamation test results differ to the extent that the soil requires amendment(s) or the proposed seed mix requires modification to achieve the desired ecological and plant community, the Operator shall submit a revised reclamation plan via Sundry Notice of Intent (NOI) (Form 3160-5). The Sundry NOI shall outline any proposed soil amendments, treatments, additives or modifications, seed mix changes and other necessary revisions to the reclamation plan.
    d. Provisions to meet Standards and Guidelines for Healthy Rangelands (43 CFR 4180.1) and obtaining desired plant communities: http://www.blm.gov/wy/st/en/field_offices/Rawlins/range.html
    e. Mitigation for direct, indirect and cumulative livestock forage losses and impacts to livestock grazing (including impacts to livestock operations and production performance). This could include reclamation that would replace forage losses from surface disturbing activities, avoiding trailing routes and livestock gathering areas and seasonal restrictions (such as during lambing and calving in specific areas).
3. The annual monitoring report shall be submitted by April 1 of each year. This report shall include reclamation and restoration efforts, including seeding/revegetation, invasive plant treatment/control, and soil stabilization and erosion prevention. The report shall be in accordance and consistent with the BLM and/or RFO Reclamation Policy, RMP (ROD) and Appendix 36, and the field/project level EA/EIS, as applicable. The yearly Operator report would include surface disturbance and reclamation data for the previous calendar year, utilizing the BLM RFO Disturbance (As-Built) Reclamation

Database. The RFO surface disturbance and reclamation database, as well as information on the database and submission of the data, will be available at: http://www.blm.gov/wy/st/en/field_offices/Rawlins/oil_and_gas.html, or by contacting the RFO, Minerals and Lands, Supervisory Natural Resource Specialist/Physical Scientist at 307-328-4200 for further information.

4. Reclamation plans and procedures, including those for seeding/revegetation and weed control, shall be modified and revised as necessary in order to achieve desired results and requirements. .
5. Reclamation earthwork for interim and/or final reclamation shall be completed within six months of well completion or well plugging (weather permitting) and shall be consistent with the approved reclamation plan. Reclamation earthwork consists of:
    a. Backfilling pits,
    b. Re-contouring and stabilizing the well site, access road, cut/fill slopes, drainage channels, utility and pipeline corridors and all other disturbed areas, to approximately the original contour, shape, function and configuration that existed before construction (any compacted backfilling activities would ensure proper spoils placement, settling and stabilization,
    c. Surface ripping, prior to topsoil placement, to a depth of 18-24 inches deep on 18-24 inch centers to reduce compaction,
    d. Final grading and replacement of topsoil,
    e. Surface-roughening and other techniques such as snow fencing to increase soil moisture retention and reduce compaction. Surface soil material can be pitted or roughened (not exceeding the applied topsoil depth) such that the entire reclamation area shall be uniformly covered with depressions constructed perpendicular to the natural flow of water and/or prevailing wind, and
    f. Seeding.
6. Interim or final reclamation of all surface disturbed areas shall commence and be completed within one year of initial disturbance unless needed for well production operations, or otherwise approved by the AO. Interim reclamation for those areas not needed for production operations, including unnecessary access roads and pipeline right(s)-of-way, shall commence and be completed within six months of well completion. Stockpiled soils shall be distributed on disturbed areas and the production pad shall be as small as possible to allow for safe and prudent production operations. Some topsoil may be reserved for final reclamation.
7. Any topsoil to be stockpiled for longer than one year shall be spread in layers not to exceed two feet maximum thickness, including topsoil underneath the pile and appropriately identified/signed as topsoil. These soil stockpiles shall be seeded with a prescribed seed mixture or sterile cover crop (included within the approved reclamation plan) and covered with mulch to reduce erosion and discourage weed invasion.
8. Temporary fencing of the reclaimed well/facilities locations for the first two growing seasons after either interim or final seeding may be required to exclude livestock and wildlife and to help ensure better re-vegetation success.
9. Any subsequent re-disturbance of reclamation shall be reclaimed within six months by the same means described in the approved reclamation plan.
10. A Notice of Intent to Abandon (Form 3160-5) must be submitted and approved prior to any well abandonment activities. A joint inspection of the disturbed areas may be required and attended by the BLM and the Operator (or Operator's Designee), the primary purpose of which is to review and agree to the existing (or a new) abandonment and/or final reclamation plan. Earthwork must commence and be completed within six months from the date of plugging and abandonment and seeding no later than

the next immediate growing season upon the completion of earthwork. All reclamation should be accomplished as soon as possible after the disturbance occurs, with efforts continuing until a satisfactory revegetation cover is established and the site is stabilized (three to five years) (RMP ROD Appendix 13-8).

11. The Operator shall submit a Final Abandonment Notice (FAN), using Form 3160-5, to the AO when adequate reclamation of surface-disturbed areas has been completed. This FAN indicates that the Operator believes the location is considered ready for final inspection, with adequate vegetation cover and species diversity. Upon receipt of the FAN, the BLM will conduct a field inspection prior to releasing the bond liability for this location.
12. Re-vegetation shall consist of species occurring in the surrounding natural vegetation and/or included in the approved seed mix as deemed desirable by the BLM or private surface owner in review and approval of the reclamation plan. Inter-seeding, secondary seeding, or staggered seeding may be required to accomplish re-vegetation objectives. The seed mixture(s) shall be planted in the amounts specified in pounds of pure live seed (PLS)/acre. There shall be no primary or secondary noxious weed seed in the seed mixture. Seed should be tested and the viability testing of seed would be done in accordance with State law(s) and within nine months prior to purchase. Commercial seed would be either certified or registered seed. The seed mixture container would be tagged in accordance with State law(s) and available for inspection by the AO. Since seeds are of different sizes and require different planting depths, the Operator would use the appropriate equipment to ensure that the seed mixture is correctly and uniformly planted over the disturbed area. Seed would be broadcast if drilling is not possible. When broadcasting the seed, the pounds per acre are to be doubled. The seeding would be repeated until a satisfactory stand is established as determined by the AO
13. All practicable measures would be utilized to minimize erosion and stabilize disturbed soils on or adjacent to the disturbed and reclaimed area. There would be no evidence of mass-wasting, head-cutting, large rills, gullies, down cutting or overall slope instability. Should the use or storage of hay, straw, or mulch be necessary, the Operator is required to use certified weed-free hay, straw and mulch on the BLM lands.
14. Evaluation of growth and success shall be conducted as per RMP ROD (Appendix 36). If the treatment area is found, through Operator site-specific monitoring data, to be successfully reclaimed, Operator monitoring to confirm reclamation success shall continue for at least five growing seasons. The site shall also comply with additional management needs, including control of weed infestations. Success criteria as defined by the RMP is: criteria based on pre-disturbance surveys or surveys of adjacent undisturbed natural ground cover and species composition (which the Operator will do prior to disturbance) or eighty percent of pre-disturbance ground cover, ninety percent dominant species, no noxious weeds, and erosion features equal to or less than surrounding area.

DRILLING

No production from the wells drilled on this well pad location should start production UNTIL Sundry Notices granting variances from Onshore Orders 4 and 5 as related to commingling and allocations are approved.

The drilling operations for this well shall be conducted in accordance with the Onshore Oil and Gas Order No. 2 as provided for in 43 CFR 3164.1. This includes the well control equipment and its testing, the mud system and associated equipment, and the casing and cementing. Any deviation from this approved drill plan pursuant to these conditions of approval requires prior approval of the petroleum engineer of the Rawlins Field Office.

BOPE (Blowout Preventer and Related Equipment)

1. All BOPE shall meet or exceed the requirements of a 5M system as set forth in Onshore Oil and Gas Order No. 2.
2. All choke lines from the drilling spool forward, shall be straight steel lines flanged at both ends, unless turns use tee blocks or are targeted with running tees and shall be anchored to prevent whip and reduce vibration. All choke lines shall have the same pressure rating as the BOP stack and choke manifold. The diameter of this line shall be a minimum of 2 inches for a 2M BOP system and a minimum of 3 inches for a 3M and greater BOP system.
3. When an Operator chooses to use flexible lines for choke operations equipment they must:
    a. Make a request for approval in advance of its use. The request must provide documentation showing the flexible hose was design specifically for the purposes of choke operations.
    b. The request for approval must include the Manufacturer's technical specifications for the flexible hose(s) under consideration. Specifications must include as a minimum:
        1) The smallest internal diameter of any section or part of the flexible hose assembly.
        2) The rated working pressure and temperature of the flexible hose assembly.
        3) The Minimum Bend Radius (MBR) at rated working pressure.
    c. Manufacturer's technical specification must be kept on site and available for inspection at all times. Flexible hoses once approved and installed must match the original manufacturer's technical specifications regarding all stated dimensions and ratings. Flexible hoses which have been altered, repaired, or remanufactured in any way from their original specification without approval or certification from the original manufacturer will not be allowed. If **the specifications are not available on site or the hose does not match the specifications, operations may be shut down until correction is accomplished.**
    d. Each flexible hose must be marked/stamped by the manufacturer with the following information clearly legible and accessible on the steel sections of each end of the flexible hose (end fittings, couplers, flanges, stiffeners, etc.):
        1) Name or identification of the manufacturer.
        2) Serial number.
        3) The internal diameter of the flexible hose assembly.
        4) The rated working pressure of the flexible hose assembly.
    e. Flexible hoses must be firmly anchored to prevent excessive whip or vibration. Anchors must be constructed in a manner capable of withstanding whip and vibration given the rated working pressure and flow rates of the well control equipment.
        1) Anchors must be attached to the flexible portion of the hose and not to the "metal end assemblies" (e.g. hubs, flanges, stiffeners, etc.)
        2) Flexible hoses of twenty (20) feet or more in total length must be supported in order to keep the hose fairly level and secure from excessive movement. Leveling support locations must also be anchored adequately to withstand whip and vibration under rated working pressures and rated flowing conditions.
        3) Each and every bend in the flexible hoses exceeding 45' must be anchored.
    f. Use, operation, and maintenance of flexible hoses will comply fully with the manufacturer's specifications unless otherwise specified by the AO.
    g. Minimum diameters for choke lines will comply with the requirements of Onshore Order No. 2, III.A.2.a.

h. Flexible hose end connections will meet all minimum requirements of Onshore Order No. 2. For example 3M systems and above require "All BOPE connections subjected to well pressure shall be flanged, welded, or clamped".

i. Flexible hoses used in Hydrogen Sulfide (H2S) operations must provide proof the hose is approved by the manufacturer for use in this type of environment.

j. Flexible hoses which are deformed (kinks, flattened areas, dents, significant surface abrasions or wear, permanent bends, etc) from the manufacturer's design and operational specification will be replaced upon discovery.

k. It is the intent of the BLM in Wyoming to implement the Reaffirmed 2001 API publication (SPEC 16C) standard for Flexible choke hoses as a uniform requirement within the next three years. Operators during routine maintenance or replacement of these hoses may want to consider hoses which can meet the **API** (SPEC 16C) standard.

4. A Form 3160-5 (subsequent Report Sundry Notice) shall be submitted to the AO's representative within five (5) working days following the test reporting the test results. The results reported will be a copy of the third party BOP test report including time and pressure charts, accumulator tests, notes/results made while performing the test, and recordation of any repair of BOP equipment made.

Casing and Cementing

1. For all **5M** BOPE systems or greater, a pressure integrity test of each casing shoe shall be performed. The formation at the casing shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
2. Pea Gravel or other material shall not be used to fill up around the surface casing in the event cement fall back occurs.
3. A Form 3160-5 (Subsequent Report Sundry Notice), along with a copy of the service company's materials ticket and job log shall be submitted to this office within 5 working days following the running and cementing of all casing strings.
4. Any change in the casing and cement design will be approved by the AO prior to the running of the casing string and/or cementing.
5. No freshly hard-banded rough carbide pipe/collars will be rotated in the surface casing.

Mud Program

1. Drilling of the surface casing will occur with fresh water only.
2. If a temporary surface pipeline is used to transport drilling water, the pipeline shall be laid and removed when the ground surface is dry so as to minimize surface disturbance. No blading or other alteration of the ground surface shall be allowed.

Directional Drilling

1. Per 43 CFR 3160.0-9 and 3162.4-2 for all wells drilled directionally, as Operator, you will be required to file with the Well Completion Report, Form 3160-4, a Certified Directional Survey.
2. This Certified Directional Survey, required by 1) above, will include a Directional Survey Certification Form as certified by the directional contractor and the Operator Bottom Hole Location Certification Form **as** specified in the Wyoming Oil & Gas Conservation Commission (WOGCC) letter to All Wyoming Oil and Gas Operators dated October 15,2009, as may be amended from time to time.

3. The requirements for a complete Certified Directional Survey are the same **as** found in the attachment to WOGCC letter to All Wyoming Oil and Gas Operators dated October 15, 2009, as may be amended from time to time.

Other

1. In the event down hole operations threaten to or cause fluid levels in the reserve pit to encroach on the required 2-foot freeboard, immediate notification shall be provided to the AO with concurrent steps taken to minimize the introduction of additional fluids until alternative containment methods can be approved.
2. Rat and mouse holes (or any sub-grade excavations for drilling operations) shall be filled and compacted, with appropriate native materials, immediately upon release of the drilling rig from the location.
3. Any permanent plug placed in the well during drilling and/or completion operations must have **prior approval** of the AO.
4. As provided in NTL4A, gas produced from this well may not be vent**ed or flared beyond an** initial test period, 30 days or 50 MMcf, whichever first occurs, without approval of the AO.
5. Drill Stem Tests shall meet or exceed the requirements set forth in Onshore Oil and Gas Order No. 2.
6. All usable water, hydrocarbon and other mineral zones must be protected.
7. Pursuant to Onshore Oil and Gas Order No. 2.III.B.l**.e.** and the Rules and Regulations of the Wyoming Oil and Gas Conservation Commission (Chapter 3, Section 22.(a) (i)), the **Operator shall report all fresh water flows encountered while drilling to the AO (Petroleum Engineer) prior to the running the next string of casing. The** reported information shall include a) well name, number and location, b) the date the water flow was encountered, c) depth at which the water flow was encountered and d) estimated water flow rate into the well bore. The Operator shall file a Form 3 160-5 (Subsequent Report Sundry Notice) of this same information within 30 days of releasing the drilling rig.
8. Open hole logs consisting of deep, medium and shallow resistivity curves, a porosity log and gamma-ray and SP curves shall be run at TD to at least 50' above any zone which may be considered to be productive of hydrocarbons.
9. **Completion Report:** In accordance with 43 CFR 3160, Form 3160-4 (Well Completion or Recompletion Report and Log) must be submitted to the AO within 30 days after completion of the well or after completion of operations being performed, whether the well is completed as a dry hole or as a producer. Copies of all open hole and cased hole logs, core descriptions, core analyses, well test data, geologic summaries, sample descriptions, daily drilling reports, daily completion reports, formation test reports, stimulation reports, directional survey (if applicable), and all other surveys or data obtained and compiled during the drilling, completion, and/or work over operations, shall be included with Form 3160-4. **Copies of all logs, as noted above, shall be submitted to this office on a compact disc in a ".las" digital file format and shall have a precision readout increment of 0.5 feet. Any Mud Log copy submitted to this office shall be in a ".tif" format.**
10. **Well Abandonment:** In the event abandonment of the hole is desired, oral approval may be granted by the AO (Petroleum Engineer), but must be followed within 5 days with a Form 3160-5 **(Sundry Notice of Intent to Abandon)** which will give the complete plan of operation that will be utilized in the plugging. Unless the plugging is to take place immediately upon receipt of the oral approval, the AO (Petroleum Engineer) must be notified at least 24 hours in advance of the plugging of the well in order that this office can witness the plugging operation. Failure to obtain approval prior to commencement of abandonment operations shall result in immediate assessment under 43 CFR 3163.1 (b)(3). The following will occur if the well is abandoned:

a. In order to reduce the visual impact of the reclaimed well site, the casing shall be cut-off at the base of the cellar or 3 feet below the final restored ground level (whichever is deeper). The well bore shall then be covered with a metal plate at least 1/4 inch thick and welded in place. On the metal plate shall the following information be permanently inscribed: i) company/Operator name, ii) lease number, iii) well name/number, and iv) well location description to the nearest quarter-quarter section (40 acres).

b. A GPS re-verification and certification of the abandoned well location shall be made for coordinates of degrees latitude and longitude with accuracy to the sixth decimal place. This well location re-verification shall be noted on the Subsequent Report Sundry Notice of Abandonment.

c. A temporary steel fence post with an attached placard indicating the well name/number and location shall be placed adjacent to the well bore until final well site reclamation has been performed and the Final Abandonment Notice (FAN) is approved.

d. Within 30 days following completion of the well abandonment, you shall file with this office, subsequent Report of Abandonment (Form 3 160-5). To be included with this report is where the plugs were placed, volumes of cement used, well bore schematic as plugged, along with copies of all service company job log and service tickets.

The Operator shall promptly plug and abandon each newly completed, re-completed or producing well which is not capable of producing in paying quantities. No well may be temporarily abandoned for more than 30 days without prior approval of the AO. When justified by the Operator, the AO may authorize additional delays, no one of which may exceed an additional 12 months. Upon removal of drilling or producing equipment from the site of a well which is to be permanently abandoned, the surface of the lands disturbed shall be reclaimed in accordance with a plan first approved or prescribed by the AO or per the reclamation conditions of approval stated herein.

SITE-SPECIFIC

Additional COAs are usually included with the above to reflect requirements that apply to local conditions, such as seasonal wildlife restrictions, special surveys, specific constraints on road or well pad location or construction, and/or additional reclamation requirements.

RIGHT-OF-WAY TERMS AND CONDITIONS

In the process of acquiring permission to obtain a right-of-way, users submit a Form SF-299 to the BLM Field Office that manages the public lands where their proposed project is located. Included with the Form SF-299 are:

- a Plan of Development that contains a description of the proposed project (map, location, details of construction, and methods for containment and disposal of waste material), geologic data, expected hazards, and proposed mitigation measures to address such hazards; and
- a reclamation plan, which includes a weed management plan.

When the BLM has completed the necessary environmental and technical review of the proposal, the BLM may approve the right-of-way as submitted or, more typically, approve the right-of-way subject to terms and conditions (T&C) on a grant.

T&C are attached to an approved grant to ensure environmental protection, safety, and/or conservation of the mineral resource. They arise from a variety of controlling authorities such as Title V of the Federal Land Policy and Management Act of October 21, 1976 (FLPMA), Section 28 of the Mineral Leasing Act of 1920 (MLA), the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), and the National Historic Preservation Act (NHPA). The T&C attached to a grant can be general in nature or site-specific, and thus will vary from one BLM Field Office to another. Often the Field Office RMP provides either a listing of potential T&C or the BMPs that might guide development of site-specific T&C in that area. They can address topics as wide-ranging as protection of wildlife habitat or archeological and paleontological sites, noise reduction, wildfire suppression, or management of invasive species. Following is a master list of T&C that are used in the Rawlins Field Office when considering a right-of-way. The list is adapted as needed for site-specific use. Many of the items listed will not be used on a specific grant if not warranted. If, on the other hand, conditions call for requirements that are not on the list, BLM specialists can add new T&C. The list is presented in the standard format used for attachment to an approved grant.

1. Terms and Conditions:
    a. This grant or permit is issued subject to the holder's compliance with all applicable regulations contained in Title 43 Code of Federal Regulations parts 2800 and 2880.
    b. Upon grant termination by the AO, all improvements shall be removed from the public lands within 90 days, or otherwise disposed of as provided in paragraph (4)(d) or as directed by the AO.
    c. Each grant issued pursuant to the authority of paragraph (1)(a) for a term of 20 years or more shall, at a minimum, be reviewed by the AO at the end of the 20th year and at regular intervals thereafter not to exceed 10 years. Provided, however, that a right-of-way or permit granted herein may be reviewed at any time deemed necessary by the AO.
    d. The attached stipulations, plans, maps, or designs set forth in Exhibits A (Additional and Site Specific Terms & Conditions), B (Plan of Development), C (map) and D (Site Specific Reclamation Plan) are incorporated into and made a part of this grant instrument as fully and effectively as if they were set forth herein in their entirety.
    e. Failure of the holder to comply with applicable law or any provision of this right-of-way grant or permit shall constitute grounds for suspension or termination thereof.
    f. The holder shall perform all operations in a good and workmanlike manner so as to ensure protection of the environment and the health and safety of the public.
    g. The holder shall comply with all Federal, State, and local regulations whether or not specifically mentioned within this grant.

h. The holder shall construct, operate, and maintain the facilities, improvements, and structures within this right-of-way in strict conformity with the plan of development which was approved and made part of the grant. Any relocation, additional construction, or use that is not in accord with the approved plan of development, shall not be initiated without the prior written approval of the BLM authorized officer (AO). A copy of the complete right-of-way grant, including all stipulations and approved plan of development, shall be made available on the right-of-way area during construction, operation, and termination to the AO. Noncompliance with the above will be grounds for an immediate temporary suspension of activities if it constitutes a threat to public health and safety or the environment.

i. The holder of this right-of-way grant or the holder's successor in interest shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d et seq.) and the regulations of the Secretary of the Interior issued pursuant thereto.

j. The holder shall have, on-site, a qualified individual (not the dirt contractor) to serve as Compliance Coordinator. This individual will be responsible for assuring that all requirements of the Plan of Development and appropriate Additional Terms and Conditions are applied. The holder must provide the name of the Compliance Coordinator to the AO prior to any surface disturbance

k. The holder shall conduct all activities associated with the construction, operation, and termination of the right-of-way within the authorized limits of the right-of-way.

l. The holder shall inform the AO within 48 hours of any accidents on federal lands that require reporting to the Department of Transportation as required by 49 CFR Part 195.

m. The ROW holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901 et seq.) on the right-of-way (unless the release or threatened release is wholly unrelated to the right-of-way holder's activity on the right-of-way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

n. The holder shall contact the AO at least 48 hours (two days) prior to the anticipated start of construction and/or any surface disturbing activities. This can be done by logging into: http://www.blm.gov/wy/st/en/field_offices/Rawlins/oil_and_gas.html. Then click on Right-of-Way Construction Notice and fill in the form and submit it. Or, you may call the authorized officer. The AO may require and schedule a preconstruction conference with the holder prior to the holder’s commencing construction and/or surface disturbing activities on the right-of-way. The holder and/or his representative shall attend this conference. The holder’s contractor, or agents involved with construction and/or any surface disturbing activities associated with the right-of-way, shall also attend this conference to review the stipulations of the grant including the plan of development.

o. The holder shall immediately notify the BLM AO of any paleontological resources discovered as a result of operations under this authorization. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the AO after consulting with project proponent. The project proponent is responsible for the cost of any investigation necessary for the evaluation and for any mitigation measures. The operator may not be required to suspend operations if activities can be adjusted to avoid further impacts to a discovered site or be continued elsewhere, however, the discovery shall be brought to the attention of the AO as soon as possible and protected from damage or looting. (modified from 43CFR3809.420(b)(8), and BLM IM 2009-011).

p. The holder shall protect all survey monuments found within the right-of-way. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the holder shall immediately report the incident, in writing, to the authorized officer and the respective installing authority if known. Where General Land Office or Bureau of Land Management right-of-way monuments or references are obliterated during operations, the holder shall secure the services of a registered land surveyor or a Bureau cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the Manual of Surveying Instructions for the Survey of the Public Lands in the United States, latest edition. The holder shall record such survey in the appropriate county and send a copy to the authorized officer. If the Bureau cadastral surveyors or other Federal surveyors are used to restore the disturbed survey monument, the holder shall be responsible for the survey cost.

q. In the event that the public land underlying the right-of-way (ROW) encompassed in this grant, or a portion thereof, is conveyed out of Federal ownership and administration of the ROW or the land underlying the ROW is not being reserved to the United States in the patent/deed and/or the ROW is not within a ROW corridor being reserved to the United States in the patent/deed, the United States waives any right it has to administer the right-of-way, or portion thereof, within the conveyed land under Federal laws, statutes, and regulations, including the regulations at 43 CFR 2800 including any rights to have the holder apply to BLM for amendments, modifications, or assignments and for BLM to approve or recognize such amendments, modifications, or assignments. At the time of conveyance, the patentee/grantee, and their successors and assigns, shall succeed to the interests of the United States in all matters relating to the right-of-way, or portion thereof, within the conveyed land and shall be subject to applicable State and local government laws, statutes, and ordinances. After conveyance, any disputes concerning compliance with the use and the terms and conditions of the ROW shall be considered a civil matter between the patentee/grantee and the ROW Holder.

r. A litter policing program shall be implemented by the holder, and approved of in writing by the AO, which covers all roads and sites associated with the right-of-way.

s. Specific sites as identified by the AO (e.g., archaeological sites, areas with threatened and endangered species, or fragile watersheds) where construction equipment and vehicles shall not be allowed, shall be clearly marked onsite by the holder before any construction or surface disturbing activities begin. The holder shall be responsible for assuring that construction personnel are well trained to recognize these markers and understand the equipment movement restrictions involved.

t. The holder shall permit free and unrestricted public access to and upon the right-of-way for all lawful purposes except for those specific areas designated as restricted by the AO to protect the public, wildlife, livestock or facilities constructed within the right-of-way.

u. Emissions of particulate matter from well pad, road, and other facility construction, operation, and reclamation activities will be minimized by application of water or other dust suppressants. Dust inhibitors (surfacing materials, dust suppressants, and water) will be used as necessary on locations that present a fugitive dust problem. The use of chemical dust suppressants on public surface will require prior approval from the BLM AO.

v. The holder shall comply with the Hazardous Materials Management Plan/Summary in the RMP ROD (Appendix 32) and /or the appropriate EIS ROD, including requirements to transport, store, utilize, and dispose of hazardous substances. The holder shall maintain a hazardous substances

release contingency plan that shall include, among other things, provision to notify the BLM AO in the event of any release of hazardous substances associated with project operations.

w. The Operator shall be responsible for the prevention and suppression of fires on public lands caused by its employees, contractors, or its subcontractors. During conditions of extreme fire danger, surface use operations may be either limited or suspended in specific areas, or additional measures may be required by the AO. Should a fire occur, it shall be immediately reported to this office by calling 307-328-4200, and notifying the Fluid Minerals staff.

x. Noise reduction techniques and designs will be considered as a mitigation measure to help reduce impacts to wildlife. The operator shall demonstrate that all reasonable attempts have been made to reduce project related noise that may negatively impact wildlife and functionality of habitats. Noise reduction techniques and designs used by the operator will be evaluated periodically by the AO to determine effectiveness. If the AO determines that existing measures are not effective, he/she may at any time require new or additional measures and techniques to alleviate the adverse effects of noise on wildlife.

y. For the purpose of determining joint maintenance responsibilities, the holder shall make road use plans known to all other authorized users of the road. Holder shall provide the authorized officer, within 30 days from the date of the grant, with the names and addresses of all parties notified, dates of notification, and method of notification. Failure of the holder to share proportionate maintenance costs on the common use access road in dollars, equipment, materials, or manpower with other authorized users may be adequate grounds to terminate the right-of-way grant. The determination as to whether this has occurred and the decision to terminate shall rest with the authorized officer. Upon request, the authorized officer shall be provided with copies of any maintenance agreement entered into.

z. Prior to termination of the right-of-way, the holder shall contact the AO to arrange a pre-termination conference. This conference will be held to review the existing reclamation plan and termination provisions of the grant or agree to a new updated reclamation plan.

SITE-SPECIFIC TERMS AND CONDITIONS:

Wildlife Resources:

1. Surface disturbing and disruptive activities potentially disruptive to nesting raptors are prohibited from February 1 to July 15. (Golden eagle, barn owl, red-tailed hawk, great-horned owl, other raptors)
2. Surface disturbing and disruptive activities potentially disruptive to nesting raptors are prohibited April 1 to July 31. (Osprey, merlin, sharp-shinned hawk, kestrel, prairie falcon, northern harrier, Swainson's hawk, Cooper's hawk)
3. Surface disturbing and disruptive activities potentially disruptive to nesting raptors are prohibited April 1 to July 31. (Short-eared owl, long-eared owl, ferruginous hawk, peregrine falcon, screech owl)
4. Surface disturbing and disruptive activities potentially disruptive to nesting raptors are prohibited April 15 to September 15. (Burrowing owl)
5. Surface disturbing and disruptive activities potentially disruptive to nesting raptors are prohibited April 1 to August 31. (Goshawk)
6. Please note the above raptor stipulation(s) may differ from past raptor stipulations as a result of the signing of the Record of Decision for the new Rawlins Resource Management Plan on December 24, 2008.

7. Surface disturbing and disruptive activities potentially disruptive to Western yellow-billed cuckoos are prohibited within one-half mile of identified habitat from April 15 to August 15 for the protection of nesting Western yellow-billed cuckoos.
8. Surface disturbing and disruptive activities within big game crucial winter range are prohibited during the period of November 15 to April 30.
9. Surface disturbing activities or occupancy are prohibited on and within one-quarter mile of the perimeter of an occupied Greater Sage-Grouse or sharp-tailed grouse lek. Disruptive activities are prohibited between 6pm-9am, April 1-May20 on and within one-quarter mile of lek perimeter.
10. Surface disturbing and disruptive activities potentially disruptive to delineated Greater Sage-Grouse/sharp-tailed grouse winter concentration areas are prohibited during the period of November 15-April 14.
11. Avoid surface disturbing and disruptive activities, geophysical surveys, and organized recreational activities (events) that require a special use permit within 2 miles of the perimeter of an occupied Greater Sage-Grouse lek, within 1 mile of the perimeter of a sharp-tailed grouse lek, or in Greater Sage-Grouse and sharp-tailed grouse nesting and early brood rearing habitat from April 1 to July 15.
12. Surface disturbing and disruptive activities are prohibited during the period of May 1 to June 30 for the protection of elk calving areas.
13. Surface disturbing and disruptive activities located in potential mountain plover habitat are prohibited during the reproductive period of April 10 to July 10 for the protection of nesting plover. Additional protection measures may be applied if this area is later determined to be within occupied habitat.
14. The project is located within an area where mountain plover broods and/or adults have been found. Additional protection measures that will be applied are attached.
15. [add other wildlife stips – amphibian, etc.]
16. Any exceptions to this/these requirements must have prior written approval from the AO.
17. *Please be advised that due to limits on the available time of qualified personnel, the unpredictability of wildlife, and future weather conditions, requests for exceptions to impending wildlife stipulations will only be considered in the event of extraordinary and unavoidable occurrences over which the company has little or no control. Additionally, construction of the pipeline needs to be started in a time frame which would allow for reasonably normal completion prior to the beginning date of wildlife protection stipulations.
18. If any dead or injured threatened, endangered, proposed, or candidate animal species is located during construction or operation, the U.S. Fish and Wildlife Service's Wyoming Field Office (307-772-2374), their law enforcement office (307-261-6365), and the BLM Rawlins Field Office (307-328-4200) shall be notified within 24 hours. If any dead or injured sensitive species is located during construction or operation, the BLM Rawlins Field Office shall also be notified within 24 hours.
19. The holder and holder's sub-contracted personnel shall not intentionally harm or harass wild horses, other wildlife, or domestic livestock.

Cultural Resources:

1. All surface disturbances, including the pipeline trench, shall be monitored by a BLM permitted Archaeologist. An open trench inspection shall be completed by a BLM permitted archaeologist for the entire length of the pipeline.
2. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the AO. Holder shall suspend all operations in the immediate area of such discovery until written

authorization to proceed is issued by the AO. An evaluation of the discovery will be made by the AO to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the AO after consulting with the holder.

Recreation:

Minimize conflicts between project vehicles and equipment and recreation traffic by posting appropriate warning signs and speed limits, conducting operator safety training, and requiring project vehicles to adhere to low speed limits, refrain from littering and drive only on approved project roads. Operators will inform their employees, contractors, and subcontractors that long term camping (greater than 14 days) on federal lands or at federal recreation sites is prohibited. Operators will direct their employees, contractors, and subcontractors to abide by state and federal laws and regulations regarding hunting and artifact collecting.

Weeds*:*

1. Weeds shall be controlled on project disturbed areas and native areas infested as a direct result of the project. The control methods shall be in accordance with the approved weed management plan (to be submitted by the Holder), and guidelines established by the EPA, BLM, state and local authorities. Prior to the use of pesticides, the holder will obtain written approval from the BLM Authorized Officer—Weed Coordinator (meaning an approved Pesticide Use Proposal form).
2. To further reduce the spread of invasive and noxious weeds following construction activities, inspections for noxious weeds will be conducted each year along with revegetation monitoring, during the first five years following construction. Thereafter, weed surveys would be conducted at least once every three years at appropriate times as directed by the AO, for the life of the project. Information from these surveys will be included in the annual report on reclamation status.

Hydrology:

1. No construction and/or reclamation shall block or change the natural course of any drainage, nor shall topsoil, waste, or fill material be deposited below high water lines in riparian areas, flood plains, or in natural drainage ways. The lower edge of soil or other material stockpiles will be located outside active floodplains. All topsoil piles will be placed where they can be retrieved without creating additional surface disturbance and where they do not impede and/or contribute sediment to watershed and drainage flows. The Operator shall also reconstruct and stabilize stream channels, drainages, and ephemeral draws to exhibit similar hydrologic characteristics that were found in stable, naturally occurring and functioning systems.
2. The holder shall construct waterbars on disturbed slopes as needed and/or prescribed by BLM hydrologist or engineer. Waterbars are to be constructed to: (1) simulate the imaginary contour lines of the slope (ideally with a grade of one or two percent); (2) drain away from the disturbed area; and (3) begin and end in vegetation or rock whenever possible.

Construction:

1. All design, material, and construction, operation, maintenance, and termination practices shall be in accordance with safe and proven engineering practices.
2. The holder shall provide for the safety of the public entering the right-of-way. This includes, but is not limited to barricades for open trenches, flagmen/women with communication systems for single-lane roads without intervisible turnouts, and attended gates for blasting operations.
3. The holder shall survey and clearly mark the centerline and/or exterior limits of the right-of-way.
4. Construction sites shall be maintained in a sanitary condition at all times; waste materials at those sites shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded

matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.

5. Construction over and/or immediately adjacent to existing pipelines shall be coordinated, and in accordance with, the relevant pipeline companies' policy.
6. No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of **four (4)** inches deep, the soil shall be deemed too wet to adequately support construction equipment.
7. Construction-related traffic shall be restricted to routes approved by the AO. New access roads or cross-country vehicle travel will not be permitted unless prior written approval is given by the AO. Authorized roads used by the holder shall be rehabilitated or maintained when construction activities are complete as approved by the AO.
8. Existing roads and trails on public lands that are blocked as the result of the construction project shall be rerouted or rebuilt as directed by the AO.
9. Fences, gates, and brace panels shall be reconstructed to appropriate Bureau standards and/or specifications as determined by the AO.
10. When construction activity in connection with the right-of-way breaks or destroys a natural barrier used for livestock control, the gap, thus opened, shall be fenced to prevent the drift of livestock. The subject natural barrier shall be identified by the AO and fenced by the holder as per instruction of the AO.
11. Accumulated snow present on the ground at the outset of construction, maintenance, or reclamation activities shall be removed before the soil is disturbed and piled downhill from the disturbed area. Equipment used for any non-construction snow removal operations will be equipped with 6" shoes to ensure blades do not remove topsoil or vegetation and written approval must be obtained before snow removal related to a federal action but outside of designated areas is undertaken. When blading/removing snow, drifts/berms shall be constructed with a gap of 35 yards every ¼ mile, to allow unobstructed movement of wildlife, livestock and human activities.
12. In accordance with the RMP, construction and other surface disturbing activities will be prohibited with frozen material unless the holder receives an approved exception. When there is a potential for frozen material, the holder is required to request in writing an exception to this limitation. This exception may be approved in writing by the Authorized Officer.
13. Prior to fill construction, the existing surface shall be sloped to avoid sharp banks and allow equipment operations. No fills shall be made with frozen or water saturated soils. Construction equipment shall be routed evenly over the entire width of the fill to obtain a thorough compaction.
14. Construction holes left open overnight shall be covered. Covers shall be secured in place and shall be strong enough to prevent livestock or wildlife from falling through and into a hole.
15. Holder shall limit excavation to the areas of construction. No borrow areas for fill material will be permitted on the site. All off-site borrow areas must be approved in writing by the AO in advance of excavation. All waste material resulting from construction or use of the site by holder shall be removed from the site. All waste disposal sites on public land must be approved in writing by the AO in advance of use.
16. Remove, and clearly segregate from all other spoil, all available topsoil from constructed locations, including areas of cut and fill, and stockpile at the site for use in reclamation on all other areas of surface disturbance (roads, pipelines, etc.).
17. Drainage and run-on/runoff shall be diverted away from all new construction naturally or through the use of diversion ditches/berms and or soil berms or stockpiles. All drainage structures shall

approximate topographic contour lines, have a grade no greater than 0.5 - 1 percent, and shall release water onto natural undisturbed ground without causing additional and/or accelerated erosion. Drainage structures shall not discharge directly into/onto natural drainages/channels, and/or use riprap or other armoring to protect from erosion (BLM Manual 9113). Water-bars, waddles, hay bales, and/or silt fences shall be used as needed to reduce surface runoff velocity and promote upland sediment deposition, thus reducing drainage/channel sedimentation and erosion.

18. The holder shall recontour disturbed areas, or designated sections of the right-of-way, by grading to restore the site to approximately the original contour of the ground as determined by the AO.

Operations:

1. Except rights-of-way expressly authorizing a road after construction of the facility is completed, the holder shall not use the right-of-way as a road for purposes other than routine maintenance as determined necessary by the AO in consultation with the holder.
2. The holder shall meet Federal, State, and local emission standards for air quality.
3. Holder shall maintain the right-of-way in a safe, usable condition, as directed by the AO.
4. The holder must be prepared to provide BLM copies of applications for and approved federal, state, and local operating permits.

Reclamation:

1. The annual monitoring report will be submitted to the BLM Reclamation Specialist by April 1 of each year. This report shall include reclamation and restoration efforts, including seeding/re-vegetation, invasive plant treatment/control, and soil stabilization and erosion prevention. The report shall be in accordance and consistent with the BLM and Wyoming Reclamation Policy, RMP (ROD) and Appendix 36, and the Continental Divide-Creston EIS. The yearly operator report would include surface disturbance and reclamation data for the previous calendar year, utilizing the BLM RFO Disturbance (As-Built) Reclamation Database. The RFO surface disturbance and reclamation database, as well as information on the database and submission of the data, will be available at: http://www.blm.gov/wy/st/en/field_offices/Rawlins/oil_and_gas.html or by contacting the RFO, Minerals and Lands, Supervisory Realty Specialist at 307-328-4200 for further information.
2. Reclamation earthwork for final reclamation would be completed within six months of project completion (weather permitting) or project re-disturbance, and would be consistent with the approved reclamation plan.

   Reclamation earthwork may include, but not be limited to:

   a. Re-contouring and stabilizing the well site, access road, cut/fill slopes, drainage channels, utility and pipeline corridors, and all other disturbed areas, to approximately the original contour, shape, function, and configuration that existed before construction (any compacted backfilling activities would ensure proper spoils placement, settling, and stabilization.

   b. Final grading and replacement of topsoil.
3. All practicable measures would be utilized to minimize erosion and stabilize disturbed soils on or adjacent to the disturbed and reclaimed area. There would be no evidence of mass-wasting, head-cutting, large rills, gullies, down cutting or overall slope instability. Should the use or storage of hay, straw, or mulch be necessary, the holder is required to use certified weed-free hay, straw, and mulch on the BLM lands.
4. The holder shall restore drainages, to the greatest extent possible, to the original bank configuration, stream bottom width, and channel gradient. Loose soil, fill, and culverts shall be removed from drainage channels as directed by the AO.

5. Revegetation would consist of species occurring in the surrounding natural vegetation and/or included in the approved seed mix, as approved by the BLM. Inter-seeding, secondary seeding, or staggered seeding may be required to accomplish re-vegetation objectives. The seed mixture(s) would be planted in the amounts specified in pounds of pure live seed (PLS)/acre. There would be no primary or secondary noxious weed seed in the seed mixture. Seed would be tested and the viability testing of seed would be done in accordance with State law(s) and within nine months prior to purchase. Commercial seed would be either certified or registered seed. The seed mixture container would be tagged in accordance with State law(s) and available for inspection by the AO. Seed would be broadcast if drilling is not possible. When broadcasting the seed, the pounds per acre are to be doubled. The seeding would be repeated until a satisfactory stand is established as determined by the AO.

Bonding:

The holder shall furnish a report to the BLM AO estimating all costs for the BLM to fulfill the terms and conditions of the grant in the event the holder was not able to do so. This estimate shall be prepared by an independent State certified engineer, and shall include such information including, but not limited to, Davis-Bacon wages potentially incurred by the BLM. The report shall detail the estimated costs and shall be accompanied by the engineer's seal if appropriate. All costs of preparing and submitting this report shall be borne solely by the holder. This report, along with BLM administration costs and inflationary estimates, shall be the basis of a performance bond after review and approval by the BLM, and shall remain in effect until such time the AO determines that conditions warrant a review of the bond. The AO may require the holder to submit a new estimate at any time during the term of the ROW. The performance bond, in a form acceptable to the AO, shall be furnished by the holder prior to any surface disturbing activities. The amount of the bond may be periodically adjusted by the AO when, in his/her sole determination, conditions warrant such a change. Should the bond furnished under the authorization become unsatisfactory to the AO, the holder shall within 45 days of demand, furnish a new bond satisfactory to the AO.

Terms and Conditions Attached to Pipeline Grant:

1. Plugs or embankments providing wildlife with access out of and across open pipeline trenches shall be installed, at minimum, every 1320 feet along open pipeline trenches.
2. The holder shall design and construct adequate water-control structures in each drainage crossing to prevent excessive erosion along the pipeline and protect the pipeline from the natural erosion process within the drainage.
3. No surface disturbing activities shall take place on the subject right-of-way until the associated APD is approved. The holder will adhere to special stipulations in the Surface Use Plan of the approved APD, relevant to any right-of-way facilities.
4. Prior to any discharge, hydrostatic testing water will be tested and processed, if necessary, to ensure that the water meets local, State or Federal water quality standards. Prior to discharge of hydrostatic testing water from the pipeline, the holder shall design and install a suitable energy dissipater at the outlets, and design and install suitable channel protection structures necessary to ensure that there will be no erosion or scouring of natural channels within the affected watershed as a result of such discharge. The holder will be held responsible for any erosion or scouring resulting from such discharge. Sandbags, rock, or other materials or objects installed shall be removed from the site upon completion of hydrostatic testing.
5. If during any phase of the construction, operation, or termination of the pipeline or related facilities any oil or other pollutant should be discharged from the pipeline system, or from containers or vehicles impacting Federal lands, the control and total removal, disposal, and cleanup of such oil or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon

failure of holder to control, cleanup, or dispose of such discharge on or affecting Federal lands, or to repair all damages to Federal lands resulting there from, the AO may take such measures deemed necessary to control, clean up the discharge, and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the AO shall not relieve the holder of any liability or responsibility.

6. The holder is prohibited from discharging oil or other pollutants into or upon the navigable waters of the United States, adjoining shorelines, or the waters of the contiguous zone in violation of Section 311 of the Clean Water Act as amended, 33 U.S.C. 1321, and the regulations issued there under, or applicable laws of the State(s) of Wyoming and regulations issued there under. Holder shall give immediate notice of any such discharge to the AO and such other Federal and State officials as are required by law to be given such notice.
7. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" designated by the Rocky Mountain Five-State Interagency Committee. The color selected for this pipeline is Covert Green (Pantone 18-0617 TPX).
8. All cathodic protection facilities shall have approval from the Department of Environmental Quality (DEQ) UIC Division and have an approved Class V, Type 5F1 permit.

Terms and Conditions Attached to Road Grant:

1. All access roads and drainage control structures, whether existing or newly-constructed, shall be both constructed to resource road standards and regularly maintained in a safe and usable condition as outlined in BLM Manual, Section 9113. A regular maintenance program may include, but is not limited to, blading, ditching, culvert installation, dust control, and gravel surfacing or other activities as specified by the AO. The Lessee and/or Operator shall enter into a maintenance agreement with all other "authorized users" of the common access road(s). The costs of road maintenance in dollars, equipment, materials, labor, and other related expenses shall be shared proportionally among the "authorized users." Upon request, the AO shall be provided copies of any maintenance agreement or agreements.
2. Prior to construction, road(s) shall be surveyed and staked with construction control stakes set continuously along the centerline at maximum 100-foot intervals (less where needed to be inter-visible) and at all tangent and curve control points, fence or utility crossings, and culverts. In addition to centerline stakes, slope stakes shall be placed at the top of the cut and the bottom of the fill for those portions of the road that are engineered.
3. Before proposed road construction activities begin, the topsoil must be bladed to the side of the road and stockpiled. The topsoil stockpile shall be contoured so as to prevent water ponding or flow concentration. Once the borrow ditch and the cut slopes are constructed, cleared vegetative material and topsoil that is windrowed shall be spread back onto the cut/fill slopes of the road, removing any windrows or berms remaining at the edge of the road.
4. The minimum travel-way width of the immediate access road will be 14 feet with turnouts at least 10 feet in width. No structure will be allowed to narrow the road top. The inside slope will be 4:1. The bottom of the ditch will be a smooth V with no vertical cut in the bottom. The outside slope will be 2:1 or flatter. After the road is crowned and ditched with a .03 - .05 ft/ft crown the topsoil and windrowed vegetative material shall be pulled back down on the cut slope so there is no berm left at the top of the cut slope. Turnouts will be spaced at a maximum distance of 1000 feet and will be intervisible. If the access road crosses a floodplain, the ditch shall be flat-bottomed so as to provide material to raise the road, unless otherwise approved by the AO.

5. If snow removal from the road is undertaken, equipment used for snow removal operations shall be equipped with shoes to keep the blade six-inches off the road surface. Holder shall take special precautions where the surface of the ground is uneven and at drainage crossings to ensure that equipment blades do not destroy vegetation.
6. Low water crossings shall be constructed perpendicular to the channel and at original channel elevation in a manner that will not block or restrict existing channel flow. Excavated material shall be stockpiled for use in reclamation of the crossings.
7. All roads and public areas shall be constructed to provide drainage and minimize erosion. Culverts shall be installed if necessary to maintain drainage.
8. All cattle guards will be designed and maintained consistent with BLM standards and shall be a minimum of 16 feet wide and 8 feet long; set on either timber, pre-cast concrete, or cast-in-place concrete bases at right angles to the roadway; have an adjacent 16 foot wide bypass gate; not narrow the road surface; and have fence and end panels on either side constructed using 3 posts with braces.
9. All culverts shall be a minimum of 18 inches in diameter. Culverts shall have a minimum of 12" of fill or 1/2 the pipe diameter, whichever is greater, placed on top of the culvert, and shall be of length sufficient to allow at least 12” of culvert to extend beyond the toe of any slope. The inlet and outlet shall be set on grade. No rocks shall be used in the bed material and no rocks greater than 2" in diameter will be immediately adjacent to the culvert. The entire length of pipe shall be bedded on native material before backfilling, which shall be completed using unfrozen material and rocks no larger than two inches in diameter; compact the backfill evenly in 6" lifts on both sides of the culvert. A permanent marker shall be installed at both ends of the culvert to help prevent traffic from damaging the culvert. Additional culverts will be placed in the new access road as the need arises or as directed by the AO.
10. Wing-ditches shall be staked and constructed at a slope of .5 to 1.0 percent down slope unless otherwise approved by the AO. In no case shall wing-ditches discharge adjacent to a channel bank.
11. All drainage ditches and culverts shall be kept clear and free-flowing, and shall also be maintained in accordance with the original construction standards.

GREATER SAGE-GROUSE REQUIRED DESIGN FEATURES

(From the Wyoming Approved Resource Management Plan for Greater Sage-Grouse, Appendix D)

INTRODUCTION

The following conservation measures have typically been referred to as Best Management Practices (BMPs) or recommended management practices. These conservation measures are treated in the Resource Management Plan (RMP) as required design features (RDFs) to ensure regulatory certainty and the conservation of Greater Sage-Grouse. The source of these conservation measures is Washington Office Instruction Memorandum No. 2012-044, (12/27/2011) BLM National Greater Sage-Grouse Land Use Planning Strategy (IM No. WO-2012-044).

RDFs are required for certain activities in Greater Sage-Grouse habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the National Environmental Policy Act of 1969 (NEPA) analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
- An alternative RDF, a state-implemented conservation measure, or plan-level protection is determined to provide equal or better protection for Greater Sage-Grouse or its habitat. A specific RDF provides no additional protection to Greater Sage-Grouse or its habitat.
- Through the coal planning process it will be determined if areas are suitable for further coal leasing consideration. Sage-grouse will be protected from leasing using the coal screening process (unsuitability criteria #15 or multiple use conflict analysis [screen 3]). The coal planning process (see 43 CFR 3420.1-4 and 43 CFR 3461) will identify areas where coal leasing is not suitable or acceptable and those areas will be removed from further consideration for coal leasing and development (i.e., they will not be leased, so no development and no further protection needed).

Mines (particularly large surface coal mines) do not have the flexibility to move operations, so it is assumed that if a lease is ultimately offered, sold, and issued, the federal coal lessee can use the entire coal lease for mining operations once they receive their federal permit. The following measures would be applied as RDFs for all solid minerals. The measures would also apply to locatable minerals subject to valid existing rights and consistent with applicable law.

PRIORITY HABITAT MANAGEMENT AREAS

The RDFs described here are to be applied to activities in the following BLM program areas: lands and realty, range management, fluid minerals, coal exploration, wild horses, travel management, wildfire and fuels management, noise, and West Nile virus. RDFs/BMPs are continuously improving as new science and technology become available and therefore are subject to change. Include from the following RDFs/BMPs those that are appropriate to mitigate effects from the approved action.

1. Evaluate and take advantage of opportunities to remove or modify existing power lines within priority sage- grouse habitat areas. When possible, require perch deterrents on existing or new overhead facilities. Encourage installation of perch deterrents on existing facilities.
2. Where existing leases or rights-of-way (ROW) have had some level of development (road, fence, well, etc.) and are no longer in use, reclaim the site by removing these features and restoring the habitat.
3. Locate man camps outside priority sage-grouse habitats.
4. Work cooperatively with permittees, lessees, and other landowners to develop grazing management strategies that integrate both public and private lands into single management units.
5. Coordinate RDFs/BMPs and vegetative objectives with the Natural Resources Conservation Service (NRCS) for consistent application across jurisdictions where the BLM and NRCS have the greatest opportunities to benefit GRSG, particularly as it applies to the NRCS's National Sage-Grouse Initiative (http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/farmbill/initiatives/andcid=steldevb1027671).
6. Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to priority sage-grouse habitats to determine if they should be restored to sagebrush or habitat of higher quality for sage-grouse. If these seedings are part of an Allotment Management Plan/Conservation Plan, or if they provide value in conserving or enhancing the rest of the priority habitats, then no restoration would be necessary. Assess the compatibility of these seedings for sage-grouse habitat or as a component of a grazing system during land health assessments (Davies et al. 2011). For example, some introduced grass seedings are an integral part of a livestock management plan and reduce grazing pressure in important sagebrush habitats, or serve as a strategic fuels management area.
7. Where the federal government owns the surface, and the mineral estate is in non-federal ownership, apply appropriate BMPs to surface development.

<u>Roads:</u>

1. Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
2. Locate roads to avoid important areas and habitats.
3. Coordinate road construction and use among federal fluid mineral lessees and ROW or special use authorization (SUA) holders.
4. Construct road crossings of ephemeral, intermittent, and perennial streams to minimize impacts to the riparian habitat, such as by crossing at right angles to ephemeral drainages and stream crossings.
5. Establish slow speed limits on BLM-administered roads or design roads for slower vehicle speeds to reduce sage-grouse mortality.
6. Establish trip restrictions (Lyon and Anderson 2003) or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).

7. Do not issue ROWs or SUAs to counties on energy development roads, unless for a temporary use consistent with all other terms and conditions including this document.
8. Designate all newly constructed routes for authorized use only (using signage, gates, etc.).
9. Apply dust abatement on roads, well pads, and other surface disturbances.
10. Close and rehabilitate duplicate roads by restoring original landform and establishing desirable habitat conditions.

Operations:

1. Conduct reclamation on unused roads as soon as possible using appropriate sage-grouse seed mixes.
2. Reclaim the permitted ROWs used in the construction of the running surface immediately.
3. Site and/or minimize linear ROWs or SUAs to reduce disturbance and fragmentation of sagebrush habitats.
4. Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
5. Bury distribution power lines to the extent technically feasible.
6. Cover all fluid-containing pits and open tanks with netting (maximum 1.5-inch mesh size) regardless of size to reduce sage-grouse mortality.
7. Equip tanks and other above-ground facilities with structures or devices that discourage nesting and perching of raptors and corvids.
8. Control the spread and effects of invasive non-native plant species (Evangelista et al. 2011), including treating weeds prior to surface disturbance and washing vehicles and equipment at designated wash stations when constructing in areas with weed infestations.
9. Require sage-grouse-safe fences (Christiansen, T. 2009; Stevens, B.S. 2011).
10. Clean up refuse (Bui et al. 2010).
11. Eliminate sumps; if the sump is absolutely necessary, then construct sage-grouse-safe fences around the sump. (Christiansen, T. 2009; Stevens, B.S. 2011).
12. Cluster disturbances, operations (hydraulic fracture stimulation, liquids gathering, etc.), and facilities. If the geology is exploratory and there is the potential that subsequent wells may not be drilled, do not disturb additional habitat until geology has proven additional wells can go on the pad and it is necessary to do so.
13. Use directional and horizontal drilling to the extent feasible as a means to reduce surface disturbance in relation to the number of wells.
14. Place infrastructure in already disturbed locations where the habitat has not been fully restored.
15. Apply a phased development approach with concurrent reclamation.
16. Place liquid gathering facilities outside priority areas. To reduce truck traffic and perching and nesting sites for ravens and raptors, do not place tanks at well locations within priority habitat areas.
17. Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).
18. Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use (Lyon and Anderson 2003).

19. Restrict the construction of tall facilities, distribution power lines, and fences to the minimum number and amount needed.
20. Design or site permanent structures to minimize impacts to sage-grouse, with emphasis on locating and operating facilities that create movement (e.g., pump jacks) or attract frequent human use and vehicular traffic (e.g., fluid storage tanks) in a manner that will minimize disturbance of sage-grouse or interference with habitat use.
21. Use only closed-loop systems for drilling operations, with no reserve pits.
22. Consider using oak (or other material) mats for drilling activities where topography permits to reduce vegetation disturbance and for temporary roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.

West Nile Virus:

1. Artificial water impoundments will be managed for the prevention and/or spread of West Nile virus where the virus poses a threat to sage-grouse. This may include but is not limited to: (a) the use of larvicides and adulticides to treat waterbodies; (b) overbuilding ponds to create non-vegetated, muddy shorelines; (c) building steep shorelines to reduce shallow water and emergent aquatic vegetation; (d) maintaining the water level below rooted vegetation; (e) avoiding flooding terrestrial vegetation in flat terrain or low-lying areas; (f) constructing dams or impoundments that restrict seepage or overflow; (g) lining the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water; (h) lining the overflow spillway with crushed rock and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation; and (i) restricting access of ponds to livestock and wildlife (Doherty 2007). This does not apply to naturally occurring waters.
2. Field offices should consider alternative means to manage produced waters that could present additional vectors for West Nile virus. Such remedies may include re-injection under an approved Underground Injection Control permit, transfer to single/centralized facility, etc.
3. Water impoundments will be managed to prevent the spread of West Nile virus where analysis shows the virus poses a threat to sage-grouse and in consideration of potential negative impact to other species of concern.
4. Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).

Noise:

1. Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. 2012).
2. Require noise shields when drilling during the lek, nesting, brood-rearing, or wintering season.
3. Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.

Reclamation:

1. Include objectives for ensuring habitat restoration to meet sage-grouse habitat needs in reclamation practices/sites (Pyke 2011). Address post-reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.

2. Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoiling, and revegetating cut-and-fill slopes where practicable; material used for irrigation must be removed thereafter.
3. Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community. Implement irrigation during interim or final reclamation for sites where establishment of seedlings has been shown or is expected to be difficult due to dry conditions.
4. Use mulching, soil amendments, and/or erosion blankets to expedite reclamation and to protect soils.
5. Identify and work with partners to increase native seed availability and work with plant material centers to develop new plant materials, especially the forbs needed to restore sage-grouse habitat.
6. Consider potential changes in climate (Miller at al. 2011) when proposing seedings using native plants. Consider seed collections from the warmer component within a species' current range for selection of native seed (Kramer and Havens 2009).
7. Use Ecological Site Descriptions (ESD) or other protocols (e.g., Terrestrial Ecological Unit Inventory or Lands System Inventory) to identify the understory species and sagebrush subspecies needed to restore desirable habitat conditions.

Vegetation Treatments/Fire and Fuels Management:

1. During vegetation management project design, consider the utility of using livestock to strategically reduce fine fuels (Diamond et al. 2009), and implement grazing management that will accomplish this objective (Davies et al. 2011, Launchbaugh et al. 2007). Consult with ecologists to minimize impacts to native perennial grasses.
2. Provide planning vegetation treatments information to personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.
3. Use vegetation treatment prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable plant species and reduce risk of hydrophobicity).
4. Ensure that treatments are configured in a manner (e.g., strips) that promotes use by sage-grouse (See Connelly et al. 2000).
5. Design vegetation treatments in areas of high fire frequency which facilitate firefighter safety, reduce the potential acres burned and the fire risk to sage-grouse habitat. Additionally, develop maps for sage-grouse habitat which spatially display existing fuels treatments that can be used to assist suppression activities.
6. Restore prior perennial grass/shrub plant communities infested with invasive species to a species composition characterized by perennial grasses, forbs, and shrubs as outlined in ESDs.
7. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
8. Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species into sage-grouse habitats. This could be minimized by planting perennial vegetation (e.g., green-strips) paralleling road ROWs. (This RDF could be applied to BLM linear ROW authorizations.)
9. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to aid in controlling wildfire, should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).
10. As appropriate, utilize existing fuel breaks, such as roads or discrete changes in fuel type, as control lines to minimize fire spread.

11. Design vegetation treatments in sage-grouse habitats to strategically reduce wildfire threats in the greatest area. This may involve spatially arranging new vegetation treatments with past treatments, vegetation with fire- resistant serial stages, natural barriers, and roads in order to constrain fire spread and growth. This may require vegetation treatments to be implemented in a more linear versus block design (Launchbaugh et al. 2007).
12. Design post-Emergency Stabilization and Rehabilitation (ES&R) and Burn Area Emergency Rehabilitation (BAER) management to ensure long-term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing, wild horses, travel management, etc., to achieve and maintain the desired condition of ES&R and BAER projects to benefit sage-grouse (Eiswerth and Shonkwiler 2006). Include sage-grouse habitat parameters as defined by Connelly et al. (2000), Hagen et al. (2007) or if available, state sage-grouse conservation plans and appropriate local information in habitat restoration objectives. Maintain these objectives, within priority sage-grouse habitat areas, as a high restoration priority.
13. Make reestablishment of sagebrush and desirable understory plant cover (relative to ecological site potential) a high priority for restoration efforts. Write specific vegetation objectives to reestablish sagebrush cover and desirable understory cover.
14. Where applicable, design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.
15. Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.
16. Use burning prescriptions which minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of annual grass invasion).
17. Ensure proposed sagebrush treatments are planned with full interdisciplinary input from the BLM (pursuant to NEPA) and coordination with state fish and wildlife agencies, and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.
18. Power-wash all vehicles and equipment involved in vegetation treatment and fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.
19. Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands, first to sites which are adjacent to or surrounded by priority/core habitat or that reestablish continuity between priority habitats. Annual grasslands are a second priority for restoration when the sites are not adjacent to priority/core habitat but within two miles of priority/core habitat. The third priority for annual grassland habitat restoration projects is sites beyond two miles of priority/core habitat. The intent is to focus restoration outward from existing, intact habitat.
20. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs or one of those referenced in land use planning documentation.
21. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
22. Remove standing and encroaching trees within at least 110 yards of occupied sage-grouse leks and other habitats (e.g., nesting, wintering, and brood rearing) to reduce the availability of perch sites for avian predators, as resources permit.
23. Design fuel treatments that would increase fire suppression efficiencies to protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas. Where applicable, incorporate roads and natural fuel breaks into fuel break design.

24. Develop state-specific sage-grouse reference information and resource materials containing maps, a list of resource advisors, contact information, local guidance, and other information relevant to agency administrators and fire suppression resources.
25. During periods of multiple fires, ensure line officers are involved in setting priorities.
26. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
27. Assign a resource advisor with sage-grouse expertise or who has access to sage-grouse expertise to all extended attack fires in or near sage-grouse habitat. Prior to the fire season, provide training to sage-grouse resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals. Involve state wildlife agency expertise in fire operations through the following:
    a. Instructing resource advisors during preseason trainings
    b. Qualification as resource advisors
    c. Coordination with resource advisors during fire incidents
    d. Contributing to incident planning with information such as habitat features or other key data useful in fire decisionmaking.
28. On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.
29. Locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas and heli-bases) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails, or other areas where there is existing disturbance or minimal sagebrush cover.
30. Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.
31. Minimize burnout operations in key sage-grouse habitat areas by constructing a direct fire line whenever safe and practical to do so.
32. Utilize retardant, mechanized equipment, and other available resources to minimize burned acreage during initial attack.
33. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.
34. Adequately document the fire operation activities in sage-grouse habitat for potential follow-up coordination activities.
35. Compile the District-level information into state-wide sage-grouse tool boxes. Tool boxes will contain maps, listing of resource advisors, contact information, local guidance, and other relevant information for each District, which will be aggregated into a state-wide document.

GENERAL HABITAT MANAGEMENT AREAS

Best Management Practices

Make applicable BMPs mandatory as Conditions of Approval within general sage-grouse habitat. BMPs are continuously improving as new science and technology become available and therefore are subject to change. At a minimum include the following BMPs:

Roads:

1. Design roads to an appropriate standard, no higher than necessary, to accommodate their intended purpose.
2. Do not issue ROWs to counties on energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
3. Establish speed limits to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
4. Coordinate road construction and use among ROW holders.
5. Construct road crossing at right angles to ephemeral drainages and stream crossings.
6. Use dust abatement practices on roads and pads.
7. Close and reclaim duplicate roads by restoring original landform and establishing desired vegetation.

Operations:

1. Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
2. Use directional and horizontal drilling to reduce surface disturbance.
3. Clean up refuse (Bui et al. 2010).
4. Restrict the construction of tall facilities and fences to the minimum number needed.
5. Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.
6. Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
7. Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.
8. Control the spread and effects from non−native plant species. (e.g., by washing vehicles and equipment).
9. Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Dougherty 2007).

Reclamation:

Include restoration objectives to meet Sage-Grouse habitat needs in reclamation practices/sites (Pyke 2011). Address post-reclamation management in reclamation plan such that goals and objectives are to enhance or restore Sage-Grouse habitat.

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